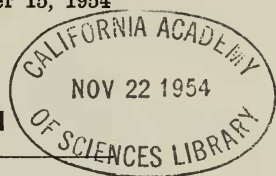


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A NEW RACER (GENUS *Masticophis*) FROM ARIZONA
AND SONORA, MEXICO

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During 1951, Mr. A. W. Ruff of Cananea, Sonora, Mexico, made a collection of living and preserved reptiles which he kindly presented to the University of Arizona. Included were two living adult red racers (*Masticophis flagellum*) which represent an unusually distinctive geographic variant in this widespread polytypic species. These are from a herpetofaunally little known area of eastern Sonora. Three additional specimens from extreme southern Arizona, in the private collection of the junior author, belong to this form described here as a new subspecies.

Masticophis flagellum cingulum subsp. nov.

Holotype.—No. 672, University of Arizona, Department of Zoology. Collected at Moctezuma, ca. 2000 ft., Sonora, Mexico, 1951, by A. W. Ruff.

Diagnosis.—Characterized by adult dark red-brown ground color on upper surfaces periodically broken by complete transverse, narrow, light-colored (pink) cross-bands which break the ground color into large, dark, longitudinally oblong sections; the cross-bands are doubled (or paired) posteriorly; a single outstanding light band crossing the nape.

Description of the holotype (measurements and color in life).—Adult female, snout-vent length, 1023 mm.; tail length (tip missing), 209 mm.; head length, 39.6 mm., contained 25.8 times in snout-vent length; head width, 19.4 mm.; ratio head length to head width, 2.04.

Scale rows, 21-17-13, with 6 at middle of tail. Ventrals, 193; subcaudals, 85 (incomplete), all divided. Anal divided. Supralabials, 8-8; infralabials, 8-9. First infralabials undivided. A mental. Chin shields normal. Internasals, prefrontals, frontal, and supraoculars normal. Parietals restricted (pointed) posteriorly. Nasals, 2-2; loreals, 1-1; preoculars, 2-2; postoculars, 2-2.

Mid-dorsally the dark brown ground color tends to be blackish brown, grading to dark reddish brown (near Pl. 7, J 12)¹ dorso-laterally and

¹Maerz and Paul (1930) color determinations. In Maerz and Paul the dark browns are particularly difficult to match.

to lighter reddish brown (near Pl. 7, J 7) laterally. Each dorsal scale tends to be darker on its posterior portion. On the anterior body, only a few scales are edged with pink (on anterior portion of scale); there is a progressive increase posteriorly in amount of pink per scale. Thus pink predominates on the posterior body and tail and the darker brown is there restricted to the posterior edges of each scale.

The upper surfaces of the head are reddish brown, distinctly darker on the supraoculars and with faint light edges to the scales. There are conspicuous pink, (Pl. 2, J 9) marks (light areas) on the labials, postoculars, preoculars, nasals, and loreal. The pink of the postnasal, loreal, and preocular is continuous and forms a "loreal stripe" from orbit to naris. Under surfaces of the head are variously colored cream and pink with small dark brown and black spots and blotches.

The ventral surface of the neck is dark pink (Pl. 2, J 9) being approximately the same color as the undersurface of the tail and of the gular area. The ventral surface at mid-body is a lighter pink (Pl. 2, G 8) than the neck and tail venters. The dark pink venter of the tail is near Pl. 2, J 8. The entire ventral surface is patterned by bold brown transverse cross lines adhering to the posterior margins of the ventral scutes and extending completely across them. These are commonly associated with brown blotches on the lateral margins of the scutes. In addition to the dark transverse lines on the neck, there are the commonly observed (in *M. flagellum*) bilateral rows of dark blotches and spots on neck and gular region gradually fading away posteriorly.

On the upper surfaces, there is a series of conspicuous light-colored transverse, narrow bands or cross-bars which extend completely across the lateral and dorsal surfaces of the neck and body. Their effect is to break up the dark ground color of the upper surfaces into several large, longitudinally oblong sections. The first of these bands is approximately four scales posterior to the parietal head plates (counting scales along the vertebral line). This anterior-most band is the narrowest and most sharply defined and is approximately one and a half scales in width. The second pink band is somewhat wider, being approximately two scales in width, and, like the remainder, is less sharply delimited along its edges than is the first. The second band is approximately 12 scales posterior to the first. The third, fourth, and fifth bands are simple single transverse bands approximately like the second. The next and last three bands or band areas (sixth, seventh, and eighth) are actually narrow double bands of pink separated by a similar narrow band of dark brown ground color. The sixth band area (double band of pink) begins approximately 75 scales posterior to the head (parietals). It is separated from the seventh band area by approximately 18 scales; the seventh is similarly separated from the eighth by approximately 17 scales. There appears to be a faint trace of a ninth band area on the posterior body half where the ground color gradually becomes the uniform braided pattern of the tail.

There is a faint, barely perceptible trace of a light longitudinal light line (pink) on the anterior body involving the first two scale rows. On the posterior body area, the lower scale row gradually becomes predominantly pink, taking on the color of the adjacent scutes. This is concomitant with the gradation posteriorly into a "uniform" braided whiplike pattern of light pink and brown. On the neck are traces of

additional pink "bands" which give a clue to a probably more banded neck in hatchlings and juveniles as is commonly seen in members of the *flagellum* complex. These traces are lacking in the larger, older paratype from the type locality.

Material.—Four paratypes are as follows: UA No. 673, Moctezuma, ca. 2000 ft., Sonora, Mexico; WHW No. 491,² 4.3 miles E. Amado, Santa Cruz County, Arizona; WHW No. 539, 2.3 miles (by rd.) S. Amado, on Nogales Hwy. (U.S. 89), Santa Cruz County; WHW No. 640, 6.1 miles (by rd.) S. Arivaca, Pima County, Arizona.

Variation.—The paratype (UA 673) from the type locality is a larger and more mature specimen than the type, with which it agrees in all important characteristics, and is with even clearer banding. Its transverse pink bands are as follows: The first band is typically sharply delimited from the ground color it separates, is approximately two scales in width and is approximately two scales posterior to the temporals. The second transverse band is slightly wider than the first and is less sharply delimited from the ground color. The difference in clarity and width of the first band from the remainder appears to be consistent. The third band is similar to the second. The fourth band is slightly wider than those anterior and is somewhat separated into two narrow bands, thus anticipating the additional racial characteristic (as seen in the fifth, sixth, seventh, and eighth bands of this specimen) in having the posteriormost band areas consisting of doubled or paired pink bands separated by a brown ground color band of similar narrow width. Beyond the eighth there is a slight trace of a ninth band area, as in the type, where in this posterior body section the color pattern of upper surfaces gradually becomes a braided whip pattern of contrasting light pink and brown. This larger specimen lacks the additional faint traces of light bands on the neck which are seen in the type.

In the two additional paratypes from near Amado, Arizona, the paired bands were less pink (more cream color) in life. The paratype from Arivaca, Arizona, shows intergradient tendencies towards *M. f. piceus* in its less prominent body bands.

The light pink to cream transverse banding of the race is more apparent in life than in preserved specimens where the bands naturally tend to become less well defined when the pink fades completely and the melanins become reduced in intensity. It should be understood that the cross-banding of the body of *cingulum* is totally unlike the common banding characteristic of the species which is usually seen best developed on the neck and anterior body. In *cingulum*, the dorsal head scales are but barely light edged and not all edges are involved. All dorsal body scales are entirely lacking a central, longitudinal streak or spot found in other races.

Ventral and caudal scale counts for the available specimens are given in Table 1.

Range.—The known range of *M. f. cingulum* is Moctezuma, Sonora, Mexico, northward to Amado, Santa Cruz County, Arizona. While Amado approximates its actual northern limit, its southern and east-west limits are unknown. However, this race appears to be a form of the upper edge of the Sonoran Desert in the scrub and grass ecotone between Desert Grassland and Desert.

²Private collection of William H Woodin, Tucson, Arizona.

The general Tucson area of southern Arizona is a yet confusing area of gene exchange between (1) the *black* phase of *M. f. piceus*, (2) the *red* phase of *M. f. piceus* (the two producing several varicolored phases between the black and red extremes), and (3) *M. f. cingulum*. Characters of the latter may occasionally appear in intergrades (= hybrids) of the other two. A living specimen from ten miles southeast of Robles Ranch 3-point Junction (vicinity of Tucson), Pima County, Arizona, is a nearly completely red snake with a few scattered jet black scales dorsally, and clear traces of the double banding of *M. f. cingulum*. Paratype WHW No. 491 shows what may also be *piceus* color in its occasional dark spots occurring on head and body. Preserved material from Cochise County of extreme southeastern Arizona appears to be intergradient between *M. f. cingulum* and *M. f. flavigularis*.

TABLE 1
Ventral and caudal scale counts of *Masticophis flagellum cingulum*

	Sex	Ventrals	Caudals
Type			
UA 672	♀	193	85 (incomplete)
Paratypes			
UA 673	♂	199	113
WHW 491	♀	201	45 (incomplete)
WHW 539	♂	200	104
WHW 640	♂	199	101